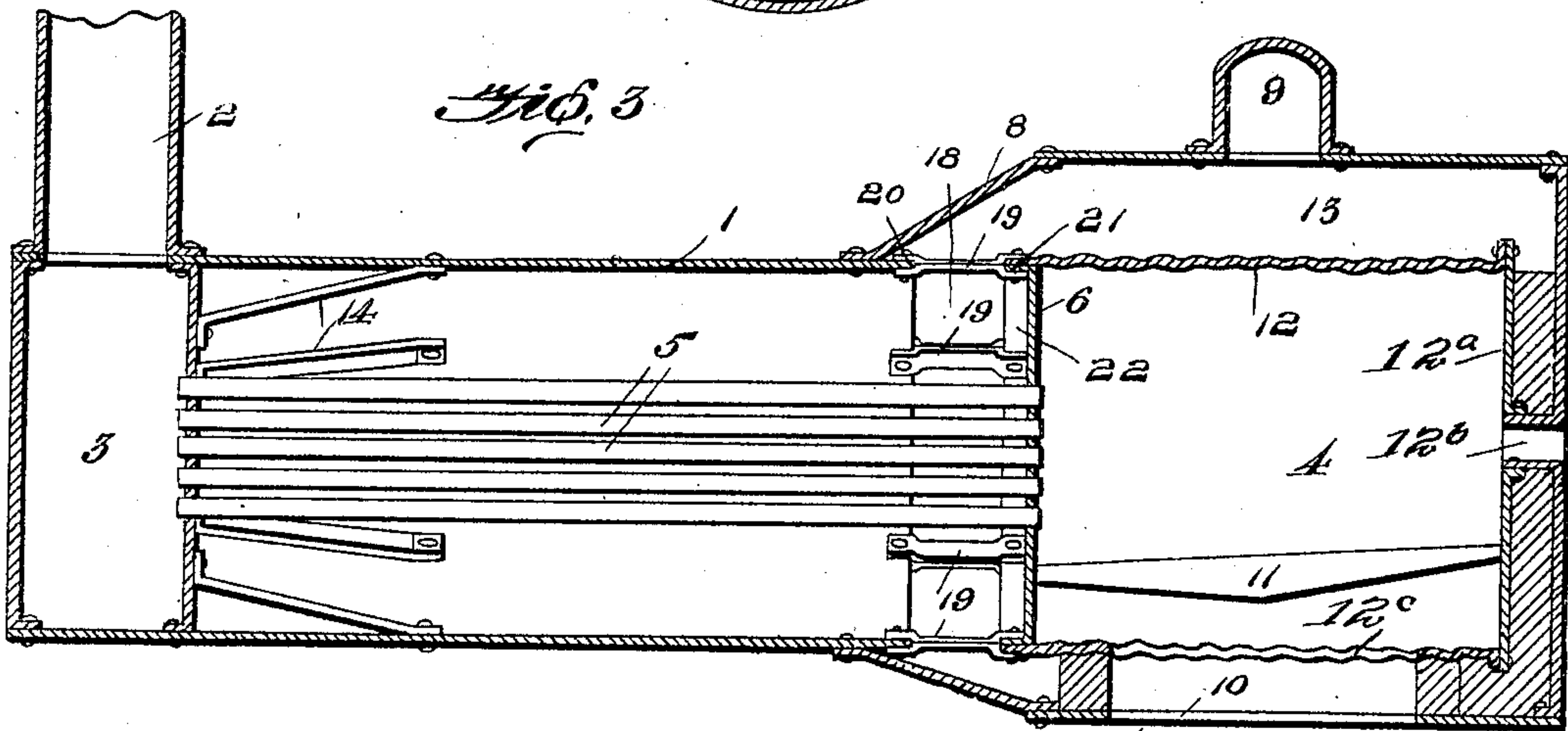
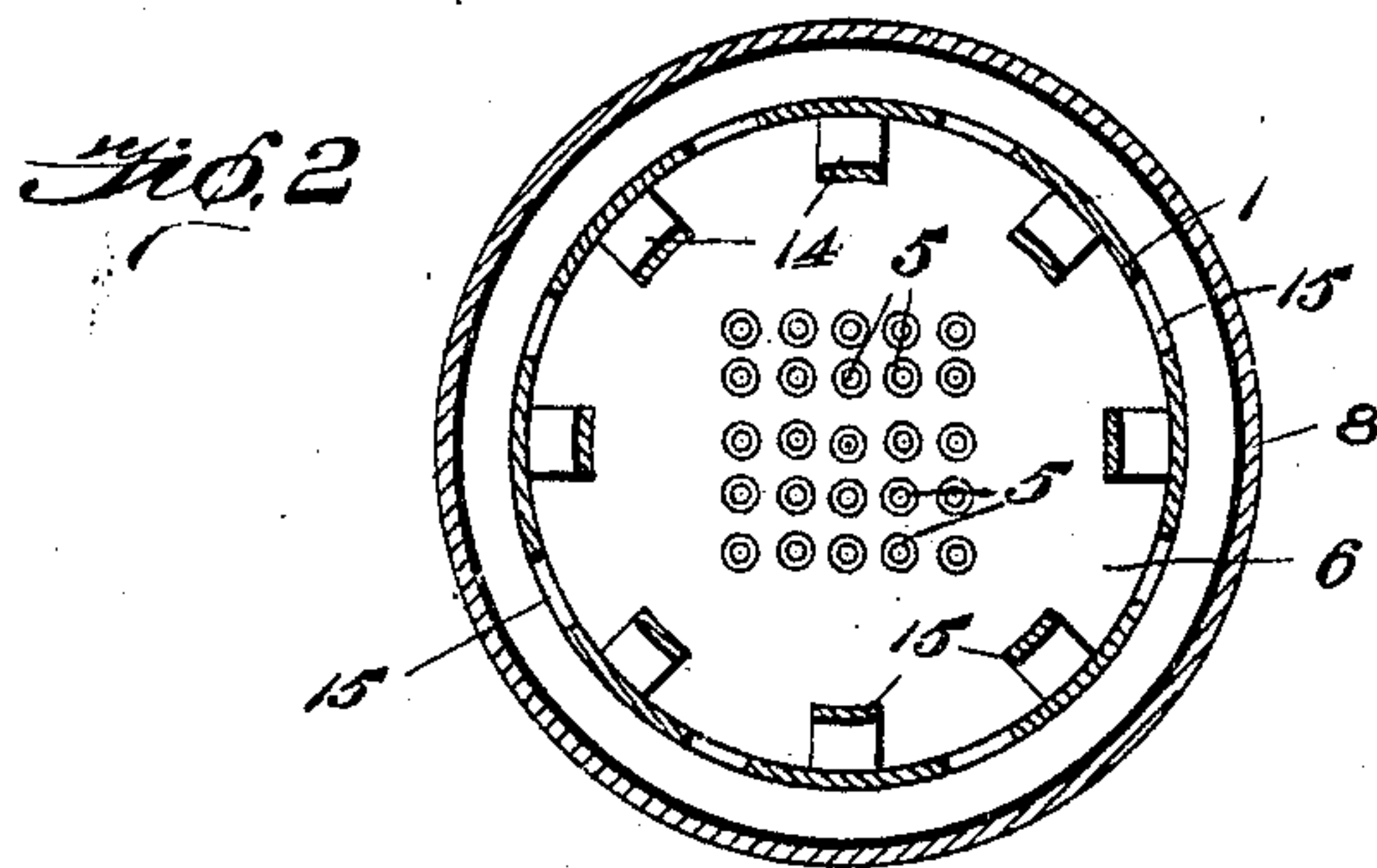
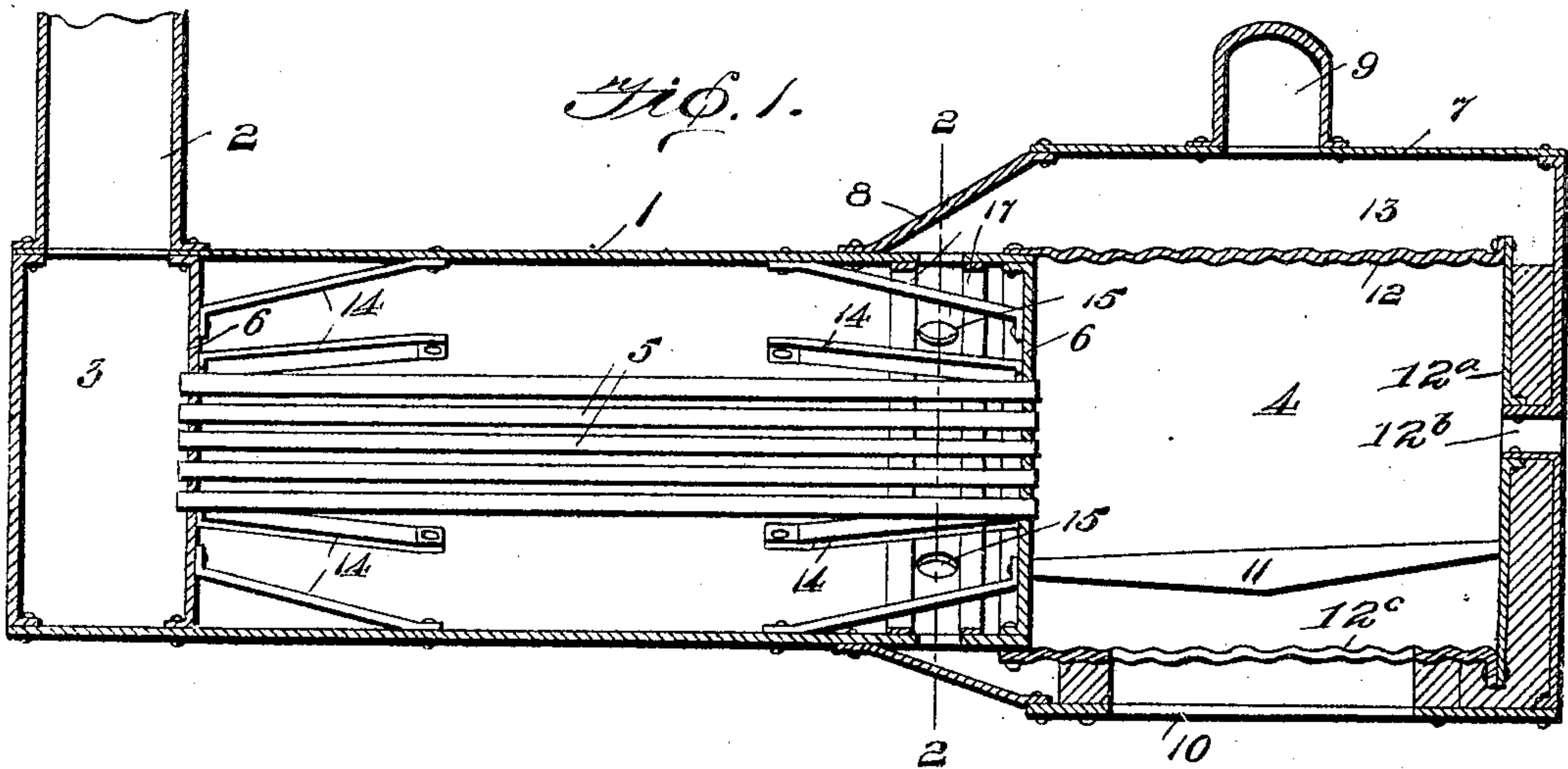


No. 804,286.

PATENTED NOV. 14, 1905.

J. A. WELTON.
LOCOMOTIVE BOILER.
APPLICATION FILED JUNE 1, 1904.



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UNITED STATES PATENT OFFICE.

JOHN A. WELTON, OF CANAL DOVER, OHIO.

LOCOMOTIVE-BOILER.

No. 804,286.

Specification of Letters Patent.

Patented Nov. 14, 1905.

Application filed June 1, 1904. Serial No. 210,697.

To all whom it may concern:

Be it known that I, JOHN A. WELTON, a citizen of the United States, residing at Canal Dover, in the county of Tuscarawas and State of Ohio, have invented a new and useful Locomotive-Boiler, of which the following is a specification.

My invention relates to locomotive and other engine boilers of the horizontal type, and has for its objects to produce a comparatively simple inexpensive device of this character which will be exceedingly strong and durable and one in which the boiler-shell will be securely braced and reinforced at its ends and in direct communication with the steam-dome, arranged in accordance with my invention above the fire-box.

To these ends the invention comprises the novel features of construction and combination of parts, more fully hereinafter described.

In the accompanying drawings, Figure 1 is a vertical longitudinal section through a boiler constructed in accordance with my invention. Fig. 2 is a section taken on the line 2 2 of Fig. 1 looking in the direction of the arrow. Fig. 3 is a view similar to Fig. 1, showing a modified embodiment of the invention.

Referring to the drawings, 1 designates the main boiler-shell, having at its forward end a smoke-stack 2, arranged, as usual, above a smoke-chamber 3, to which the smoke and other products of combustion are conducted from the fire-box 4 through the medium of horizontal pipes or tubes 5, disposed within the shell 1 and having their ends seated, as usual, in plates or tube-sheets 6, secured by rivets or otherwise and at suitable points within the shell 1. These parts, except as hereinafter described, may be of the ordinary or any preferred construction and material.

The fire-box or combustion-chamber 4 is contained within a secondary shell 7, connected with the main shell by a gusset or bias piece 8, which is riveted at its ends, respectively, to the shells 1 and 7. Above the fire-box and upon the shell 7 there is mounted a steam-dome 9 of ordinary construction, while beneath the fire-box is the usual opening 10 for the escape of ashes, &c., there being arranged above said opening grate-bars 11, as usual.

The fire-box 4, to which reference has been made, consists of a cylinder 12 approximately of the same diameter as the shell 1 and in the form of the invention shown in Fig. 1 secured at one end to the latter, the other end of the cylinder having riveted to it a plate 12^a,

having therein a fire-door 12^b, as usual, and having its lower side cut away, as at 12^c, to permit escape of ashes or the like. This cylinder is shown as longitudinally corrugated throughout its entire extent to permit expansion and contraction and is spaced from the shell 7 to form a steam-chamber 13, which communicates with the dome 9, it being seen by this arrangement that the steam will be thoroughly dried and heated and that owing to the position of the dome 9 the high temperature of the steam will be maintained, thereby obviating a partial condensation of the steam within the dome.

For bracing the shell 1 adjacent to its ends and in relation to the vertical plates 6 I provide a series of diagonally-disposed bracing members 14, having their outer ends angularly bent and riveted to the sheets 6 and their inner ends spaced circumferentially around and riveted to the shell 1, with the interior face of which they contact. The main shell 1 is provided adjacent to its rear end with a series of circumferentially-spaced openings or passages 15, whereby the steam generated in the boiler may pass freely to the steam-chamber 13 and dome 9, the steam after passing through said openings being deflected and directed toward the dome by means of the bias piece 8, which immediately surrounds the perforated portion of the shell 1, it being noted that the braces 14 alternate with or are arranged between the openings 15, whereby they offer no hindrance to the passage of steam through the latter.

Disposed upon the inner side of and riveted within the shell 1 is a pair of bracing and strengthening rings 17, disposed, respectively, on opposite sides of the perforations 15, thus counteracting the weakening of this portion of the boiler resulting from the formation of the perforations.

In practice the heat and flame from the combustion-chamber will be conducted, as usual, by means of the tubes 5, through the water contained in the boiler, and the steam generated from the latter will pass, as above explained, through the openings 15 to the steam chamber and dome, where it will be heated and dried, as before stated, owing to the arrangement of these parts above the fire-box.

In Fig. 3 I have shown a slightly-modified embodiment of the invention, in which the construction and operation is identical with that above described, except that the main shell 1 is terminated at its rear end short of

the tube-sheet 6, thereby producing a continuous steam-escape opening 18, having the same function of the series of openings 15, and that the rear terminal of the shell 1 is connected with the tube-sheet 6 by means of double parallel braces 19, arranged in pairs, as shown, and having their ends angularly bent in opposite directions to produce bifurcated portions or seats 20 21, which receive, respectively, the end of the shell 1 and a horizontal flange 22, formed upon the sheet 6, the seats 21 serving, further, to receive the adjacent edge of the cylinder 12.

From the foregoing it will be seen that I produce a comparatively simple inexpensive device admirably adapted for the attainment of the ends in view, it being understood that minor changes in the details herein set forth may be resorted to without departing from the spirit of the invention.

Having thus described the invention, what is claimed is—

1. In a boiler, a main shell, a secondary shell connected therewith and provided with

a steam-dome, and a fire-box corrugated throughout its entire extent and arranged within the secondary shell and connected with the main shell.

2. In a boiler, a main shell provided with steam-escape openings, a tube-sheet, a fire-box corrugated throughout its entire extent and secured to the main shell, and a secondary shell inclosing the fire-box and spaced therefrom and provided with a steam-dome.

3. In a boiler, a main shell, a tube-sheet secured to but spaced therefrom, a secondary shell connected with the main shell and having a steam-dome, and a fire-box corrugated throughout its entire extent and secured to the tube-sheet.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of witnesses.

JOHN A. WELTON.

Witnesses:

ED. C. SEIKEL,
S. B. MCGUIRE,
H. C. CAMPBELL.